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ABSTRACT

A project sponsored by the Council on Library Resources in which the science and engineering libraries at 22 selected universities were studied is summarized in this report. The study was concerned with only certain aspects of such libraries, namely collection development, reader services, physical facilities, and professional staff attitudes and background. Twenty of the universities are in the United States, and two in Canada. The proposal was to examine the campuses at first hand and then interview not only librarians but also a selected number of faculty members and students. The purpose was to try to get a balanced view of the actual status of these libraries. Medical libraries were excluded in order to avoid having too broad a scope for the project. This report describes the plan for carrying out the project, the detailed results, and some general conclusions. Descriptions of the library systems in the study and copies of the survey questionnaires are appended. (Author/SJ)

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UNIVERSITY SCIENCE AND ENGINEERING LIBRARIES - A SURVEY

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I. Introduction

This report summarizes a project, sponsored by the Council on Library Resources, in which the science and engineering libraries at 22 selected universities were studied. The study was concerned with only certain aspects of such libraries, namely collection development, reader services, physical facilities and professional staff attitudes and background. Twenty of the universities were in the U. S. and two in Canada.

During these days of more restrictive budgets the operation of university libraries is difficult enough, and in the case of science and engineering libraries there are additional complications. One of these problems is that of finding the proper role in connection with the many bibliographic services now available on magnetic tape, for computer searching. Most of these services involve the sciences and engineering, where the burden of coping with them falls, as contrasted with the relative paucity of such services in the humanities and social sciences. Another vexing situation is that of managing the current tight budgets for collection development in light of the high prices for technical literature, as contrasted with lower average prices for books and serials for non-technical subjects. Still another problem generally common to technical libraries at universities is the question of location and quantity of facilities in relation to the placement and number of buildings housing science and engineering classrooms and laboratories. It is by no means a new matter, but still one that continues to puzzle library administrators. These were some of the considerations which made a survey of libraries in this category seem worthwhile, one which has probably not previously been done in quite the fashion proposed.

The proposal was to examine the campuses at first hand and then interview not only librarians but also a selected number of faculty members and students. The purpose was to try to get a balanced view of the actual status of these libraries, which required hearing from both sides of the fence. Medical libraries were excluded in order to avoid having too broad a scope for the project. The following pages describe the plan for carrying out the project, the detailed results and some general conclusions. Various related information is found in the appendixes.

II. The Plan for the Project

As mentioned previously, the goal was to study the following aspects of science and engineering libraries: reader services, physical facilities, collection development and professional staff qualifications and attitudes. Included in these topics were such questions as the use of automation, budgetary problems and their effects and the matter of centralization of technical library facilities versus decentralization.

In selecting the schools to be visited on this project the goal was to get a good mixture of universities in regard to enrollment, library size, type of setting (urban versus non-urban), degree of centralization of technical library facilities, interest in automation, type of funding (private versus government support), etc. A brief description of the schools can be found in Appendix A. It was not easy to make the selection, and many potentially interesting

universities had to be eliminated because of the limitations of time.

Rather than get just the viewpoints of the librarians, at each school a cross-section of users was also interviewed, picked at random, consisting of professors and graduate students, with a few undergraduates included. The latter seemed to have such meagre observations to make about library operations that it seemed wiser in interviewing students to concentrate on graduates, who, in general, were much more concerned about and aware of library conditions than undergraduates.

Two types of questionnaires were used, one for librarians and the other for the users (see Appendix B and C respectively). In many cases the questions had to be carefully explained to users, several of whom had difficulty grasping what was meant by some questions, as routine as they seem to librarians. On the other hand, interviewees would often volunteer information that was just as valuable as the answers called for in the questionnaires. Such instances helped confirm the belief that personal interviewing can be more accurate and informative than mail surveys. As usual a few questions were found to be a bit awkwardly worded, but for uniformity the same questionnaire was used throughout the project. Even during intersessions, or near holidays, there was no real difficulty in locating professors and graduate students, who seem to work long hours during summer months. In many cases the offices of various departments of instruction were helpful in indicating which professors were apt to be on hand. By using a random selection, the problem of interviewing users known to be favorably inclined towards the performance of the libraries was avoided, a case which would have cast doubt on how well they represented all users. Almost without exception they were very cooperative in their attempts to give their opinions.

Some universities had so many librarians serving in science and engineering libraries that only a portion of them were interviewed, whereas in some smaller schools each librarian in this category was interviewed. Librarians also were extremely helpful and showed great interest in the project.

In the case of both users and librarians, efforts were made to get a good cross-section of different disciplines and physical locations (close to the library versus far from the library, etc.). A few professors who were on library committees were inadvertently included, and they often had a greater amount of information to contribute than their colleagues.

For what it is worth, members of minority groups were not very numerous among the librarians interviewed. This was probably merely a reflection of the number of such librarians working in university libraries of any sort. Women were well represented, the ratio being two women librarians for every man. No female professors happened to be interviewed, while 12 of the 60 students were women, most of them in the life sciences. No effort was made to include or exclude users because of their sex, but it was obvious that men were in the preponderance both among the faculty as well as among the students.

In addition to users and the librarians serving in the science and engineering libraries, interviews were also held either with the director of each library

system or with an associate director (with but one exception, where the top administrators could not be reached on the date of the interview). Such interviews were unstructured, with the aim being that of getting an over-all view of what was happening on that campus as well as learning how such administrators viewed the operation and funding of university science and engineering libraries versus libraries serving the humanities and social sciences at their schools. Once again the cooperation was excellent, and many useful ideas came to light. Visits were made much easier due to their assistance. The duration of the visits was generally two days for the larger systems and one day for smaller ones, yielding acceptable results as far as having enough time to see the libraries and conduct the interviews.

In addition to the top library administrators, 67 science and engineering librarians were interviewed, along with 83 faculty members and 60 students (all but four of whom were graduate students). A breakdown of the subject areas of those interviewed is as follows:

Subject Areas of Those Interviewed

	Chemistry	Physics & Astronomy	Math	Engng	Life Sciences	Earth Sciences	General Science & Engn	Misc	Total
Librarians	10%	10%	5%	30%	10%	10%	22%	3%	100%
Faculty	17	18	8	24	22	10	-	1	100
Students	17	13	3	32	28	5	-	2	100
Total	14%	14%	6%	29%	20%	8%	7%	2%	100%

So, while the total number of interviews is not large, all major fields are represented, and no one field overwhelms the others.

All interviewees were promised anonymity of their responses, so care will be taken so as to fulfill this agreement in the data disclosed in this report.

III. Tabulation and Analysis of Interviews

All interviews, whether with technical librarians or users, covered the same four major topics, although only some of the questions were identical. The unstructured discussions with library directors also centered around these same topics. Therefore in showing the results and analyzing them the material will be divided into these four major topics, with the results and analysis of each source- librarians, users and directors included under each of the four topics, which are: 1) Reader Services; 2) Facilities; 3) Collection Development and 4) Professional Staff Attitudes and Background.

In answering questions involving evaluations of library features, interviewees were asked to make their judgments in terms of the level or quality of library performance they would expect their school to provide, keeping in mind its size, goals, etc. This method was adopted in lieu of having users trying to make

comparisons with libraries they may have known elsewhere, or trying to have them visualize a national model of library excellence with which to compare. It is readily admitted that making judgments of this sort on any basis of comparison is a subjective process, dependent upon the person's previous experiences. Nevertheless, such questions were felt to provide useful information as to how users generally regarded their libraries.

A. Reader Services

1. This question revealed the rating librarians themselves placed on the quality of their reader services. For a comparison of how users viewed this same topic, see #2.

   Would you characterize the services normally offered by your library, on the whole, as

Excellent	21%
Better than average	52
Average	21
Unsatisfactory	6

2. Responses by users to the same question as #1. Note that users were more favorable in their ratings than librarians.

   What is your opinion of the quality of service offered by the libraries devoted to science and engineering on your campus, for an institution of the size and status of your school?

	Faculty	Students
Excellent	35%	27%
Better than average	50	52
Average	13	21
Unsatisfactory	2	-

3. The librarians describe the particular services needing betterment. Note that 15% could not name one.

   Which service offered seems to you to need the most improvement?

Reference (general)	42%	Hours too short	8%
Reference-bigger staff	17	Photocopy service	5
None	15	Circulation & recall	5
Interlibrary loan speed	10	Technical report service	5
Library instruction	9		

4. The librarians describe their concepts of their users' complaints. For the users' version, see #5. Correlation is spotty.

A. Reader Services (Cont'd)

What is the most common complaint of your users regarding your services:

Hours too short	18%	Not aware of	7%
Circulation rules	18	Bindery slow	7
Missing books (security)	17	Interlibrary loans too slow	6
Hard to find books. . . .	13	Layout confusing . . .	6
More copies of key books	10	Fines system	5

5. The users' equivalent of #4. Note the high percentage of users who could not name a major complaint when interviewed.

What is your biggest complaint about services offered?

Faculty		Students	
None	43%	None	28%
New books slow to be ready.	11	Hours too short . .	25
Hours too short. . .	7	Longer loans. . . .	12
Binding too slow . .	7	Circulation rules .	10
Hard to find books .	6	Security.	9
Security	6	Reshelving too slow	9
		Interlibrary loans too slow	7

6. Librarians name the unusual services offered, or services they would like to offer. Note that one-fifth had none to suggest.

Do you offer any unusual services to your users? If so, what? If not, what services would you like to add?

None . . . 21%

Services Offered

Own tape searches . . .	26%	Pre-prepared bibliographies . .	5%
Regional tapes	13	Electronic desk calculator . .	5
Messenger service . . .	13	Computer terminals	5
Library instruction . .	12	Linguistic skills	5
Profile preparation . .	10	Audio/visual aids (library instruction)	5

7. The users state the new services they would like. The percentage of those unable to name one is quite high.

What, if any, new services would you like to see instituted?

Faculty		Students	
None	64%	None	77%
More computer searching	5	Computer tape searches	5
Better photocopying. .	4		

A. Reader Services (Cont'd)

8. Effects on reader services of automation (any service or product involving a computer) in current use are described by librarians. Examples are included.

What effect has automation had on the services rendered by your library?

		Examples	
Little or none	22%	Union lists of serials	46%
Rather helpful	30	Tape searches	22
Very helpful	46	In-process status lists	21
Not involved at present.	2	Circulation records	10
		MARC tapes	7

9. Future types of automation desired by librarians, as distinct from the current situation as rated and listed in #8. Note the high ratings given union lists of serials in both questions.

What uses of automation would you like to see instituted in your library (in regard to services to the public)?

Circulation records	30%
Union lists of serials	26
In-process status data.	23
Tape searching	20
On-line catalogs	15
No comment	7
Book catalogs	5
MARC tapes	5

Analysis of Questions 1 - 9

One outstanding feature is the relatively high regard users had for these libraries and the high percentage of users unable to name major complaints or to list new services desired. It is possible that many of them have never thought hard about what they are getting or should be getting in the way of library service. A few professors who worked in industrial laboratories where special library service was available seemed to be more aware than their colleagues of what better service consisted of.

It is evident in #5 that graduate students are upset more than professors by reduced library hours, especially during summers and holidays. Their 25% response was one of the highest totals for a specific topic in any question involving a free choice, for students or faculty.

Library Directors' Comments on Reader Services:

As previously mentioned, they were asked to comment on the four major topics of the survey but also on a broader scope, if they so desired. A summary of their comments on this particular topic follows:

Several directors expressed a need for more information as to how scientists and engineers work and how they use technical information. (Current research

A. Reader Services (Cont'd)

on this topic is available and is being increased regularly, but they did not seem satisfied with the information known to them). Others spoke more confidently about how such users work, primarily feeling that scientists and engineers usually knew exactly what specific references they wanted when they contacted the libraries, in contrast with the humanists and social scientists, who were more apt to be looking for material on certain subjects rather than specific citations. On the other hand, some thought health scientists were apt to demand more individual reference service than their colleagues in other areas of science. Still other directors felt that the social sciences would begin to catch up with science/engineering as far as machine-readable data bases and tapes were concerned. Yale University, for one, is developing a centralized social science data archives.

Several libraries operate delivery systems to get requested items to faculty members, particularly Georgia Tech and the University of Toronto, who seem the most advanced in their operations. The latter school makes twice a day deliveries to a possible 60 points on the campus, with three library trucks involved. They felt delivery systems took the pressure off the library systems who were operating under a centralized library plan,as at Georgia Tech.

Many expresssed a desire to do more in the way of offering automated SDI service although they reported that there was no overwhelming demand for it from the faculty so far.

More of their comments on SDI systems will be found in the collection development section. Automation was seen to be a necessary and desirable practice in most libraries, but the extent varied greatly. As for other new techniques, the use of a microfiche catalog at Georgia Tech was the most outstanding use of microfilm noted. Their collection of 750,000 volumes is cataloged on some 700 microfiche, of which 50 sets are found across the campus, some being located in departmental offices. Users were said to like it. COM (computer-output microfilm) equipment was used to produce the microfiche involving those items in machine-readable form in the collection. Supplements are planned.

Author's Comments on Reader Services

It was apparent that some library systems visited were much more service-oriented than others. Some were almost at the point of being too innovative as far as their rather conservative faculty members were concerned. Two libraries- Stanford and Georgia Tech-seemed to be the most active in soliciting reference work from business and industry. The former has been at this since 1959, having around 500 companies, not all active, on their rolls. Among other charges there is a $5.00 fee for each loan of library material.

The greatest concentration of automated SDI service was at the University of Georgia, where a large government grant was in full force. Some 3000 users (on and off campus) were having profiles run, with the results being used by approximately 5,000 people, due to sharing of information. They have around 12 different data bases available. On-line experimental service is carried on with Lehigh University, using CRT equipment. No charges are made to users in the Georgia educational complex as long as the grant continues, but they have little data yet as to user reaction to paying for the service.

A. Reader Services (cont'd)

UCLA also has an active government grant for SDI service, and they are making this service available to library systems in California and nearby states. It is interesting to note that repeatedly librarians volunteered their feelings that word of mouth advertising was their best way of getting scientists interested in such service.

Library instruction is beginning to get more attention, with Georgia Tech having one full-time professional staff member devoted to this duty. Other schools, such as Columbia, are appointing librarians with this function as a major portion of their duties. The University of Pittsburgh held a term paper clinic, advertising it in the student newspaper, offering library assistance to students. Dozens signed up, and volunteer librarians were matched with the students' subjects so as to give personal attention to each student. Next year they plan to do it nearer midterms, when the topic is more prominent in student life.

Probably the library open the most hours was at Johns Hopkins, open from 8 AM to midnight, 365 days a year. There is also a nearby reading room open for five nights from 11 PM till 8 AM, thus giving students 24 hour access to either the library or a study area. The University of Georgia science library was open until 2 AM, as was California Institute of Technology. In most cases only one person was on duty during the late hours at these schools.

To aid users in a new library, the University of British Columbia has a plastic model library on display, with lights showing the directions to a particular area when a button is pushed. No count was made of the number of extended reference problems handled or bibliographies prepared, but it appeared that the professional staff in centralized libraries had more time to concentrate on such matters as compared to the smaller one-man (one professional) libraries. Security affected many libraries, with only a few using special detection systems to combat book losses.

B. Physical Facilities

This section was concerned with the location, design, layout and equipment of the libraries serving science-engineering.

10. Librarians rate the libraries in which they work. See #11 for user ratings.

Would you rate the physical facilities and locations of your libraries, on the average, as?

Excellent	20%
Better than average . .	36
Average	24
Unsatisfactory	20

11. Each user rates the science/engineering library he used the most. Note that their ratings are more favorable than the librarians.

What is your opinion of the physical facilities of science and engineering libraries on your campus, again considering what is appropriate for local standards?

	Faculty	Students
Excellent	36%	41%
Better than average	35	31
Average	19	22
Unsatisfactory	10	6

B. Physical Facilities (Cont'd)

12. Librarians itemize the main problems with facilities. Note how lack of space predominates the answers. See #13 for user ratings.

What is the major problem in this regard?

More space	61%	Noise	10%
General	34%	Heating & ventilating .	10
Collections . .	21	None	10
Seats	6	Lighting	6
General layout	30		

13. Users give their reasons for complaints about facilities. Note the large number unable to name a major complaint.

What is your main complaint regarding the facilities?

Faculty		Students	
None	47%	None	50%
Too crowded.	13	Too crowded	17
Too far away	8	Poor layouts	10
Too many small libs. .	7	Lighting bad	7
Poor layouts	6	Heating & ventilating .	7
Catalog not convenient	6		

14. The question of centralization of facilities is asked of librarians. Since "stay about as is" is rather meaningless unless the local situation is known, the author has assigned such answers to a more definite status, as shown in question 14 b., using his knowledge of the campus to do so. See #15 for user ratings.

What is your feeling about centralization of facilities?

a. Become more centralized .	42%	b. Favor centralization . .	70%
Stay about as is	46	Favor less centralization	30
Become less centralized .	12		

15. Users answer about centralization preferences. The same techniques used in #14 are applied here to make "stay about as is" more meaningful. Note that both user groups are nearly evenly divided on the subject, in contrast to the librarians. It should be noted that many users who were satisfied with centralization were so because of departmental reading rooms in the buildings in which they were located.

What is your feeling about centralization of facilities?

	Faculty	Students
a. Should be more centralized	13%	12%
Should stay about as is	81	83
Should be less centralized	6	5
b. Favor centralization	43	45
Favor less centralization.	57	55

B. Physical Facilities (Cont'd)

16. Librarians estimate how their opinions agree or disagree with those of their users. In general they are too optimistic about agreement.

Do you think your feelings on question #14 match those of?

	(a) Faculty members	(b) Graduate students	(c) Undergraduates
Yes	52%	62%	40%
No	28	17	10
Don't know	20	21	50

17. Librarians comment on automation and facilities. Note high order of agreement.

What effect do you think the changes caused by automation have had in the number, location and design of your library facilities to date?

Little or none	92%
Some effects	6
Major effects	2

18. Librarians estimate future effects of automation on facilities.

In what ways do you expect this to change in the next 5-10 years?

Computer terminals	40%
Little or no changes	32
Some changes	18
No comment	10

Analysis of Questions 10 - 18

One of the thorniest problems on some campuses is that of deciding whether or not to centralize science/engineering libraries, and if so, which ones and where. Local factors, such as size of campus, previous library patterns and other factors had much to do with the reactions of users. Reading rooms, under the care of departments of instruction and manned by non-librarians were seen by most users (about 60% of the faculty members) as being an indispensible part of a policy of centralization of libraries. On the other hand, the librarians clearly favored centralization. Users complained of greater distances to travel, less concern for their needs and greater difficulties in finding what they wanted as major reasons against larger, merged libraries. Librarians saw centralization as an opportunity to offer longer hours of service, better reference service, fewer places to look for material and reduction of duplicated library materials as their chief reasons for favoring centralization. Even some of the users agreed that centralization eliminated going to several libraries in search of certain materials. Delivery service and good photocopy service (including phone service and allowing charges to faculty contracts and grants), were major factors which helped win acceptance of centralized libraries in several schools. A very good reference staff also was considered important in such situations. The University of Georgia and Georgia Tech were two large campuses where centralization of libraries was apparently well accepted, and where the above-mentioned extra features were in evidence.

B. Physical Facilities (Cont'd)

It was clear that lack of space was the most common complaint of librarians regarding facilities, and, on a smaller scale, was the most commonly cited point by users also.

The effect of automation on facilities was generally agreed to be minimal, with only two or three libraries having computer terminals in them. The most common physical effect of automation was the rearrangement of circulation desks due to reliance on computer-produced circulation records, usually in book form.

Library Directors' Comments on Physical Facilities

Many of them expressed concern about the question of centralization, some being resigned to decentralization because of the size of their campus, or the political aspects, or the type of organization (since not all library systems had full responsibility for all campus libraries), etc. Most of them saw centralization as involving a trade-off between efficiency and user convenience. They were aware of the resistance to centralization among some users. Strong university administration backing was seen as a prerequisite for centralization on most campuses. Most science library facilities were viewed as little different than those for other disciplines, although photocopying facilities were thought to be more important to scientists/engineers. Directors too, were uncertain about the number of terminals needed for future automated projects; some had designed newer facilities with wiring needs for terminals in mind.

Most directors were sympathetic to the desire scientists/engineers had for departmental reading rooms as a sort of substitute for a full-fledged library in their building. Such reading rooms were generally watched over by secretaries in the department, with the library contributing little to the system. At the University of British Columbia, on the other hand, they have 38 reading rooms, with one professional librarian assigned to visit them weekly and help train the departmental secretaries, with the libraries purchasing thousands of dollars worth of books and journals for the reading rooms (with faculty members contributing gift books and journals too). One of their reading rooms had 50 seats and was beautifully equipped. The average reading room, at schools having them, had around 20 journal subscriptions and 500 or so books, often requiring a key for graduates and faculty members to enter, and they were thus open as long as the buildings housing them were open. Most of their holdings duplicated items in the official libraries.

Author's Comments on Library Facilities

The universities visited had a wide range of science/engineering library facilities. At one extreme were the new ones, with attractive equipment, carpeting, air-conditioning, good layouts and plenty of space for growth. At the other extreme were old ones, marked by crowded conditions, lack of air conditioning, noisy and with poor equipment and bad layouts. Although users were relatively patient with library conditions, being reluctant to term them as unsatisfactory, they really had every right to be dissatisfied with some of the libraries serving them when they were rating the latter class described above. Certainly librarians were not abashed about it, naming 20% of them as unsatisfactory. The fact that they spend all their working hours in the facilities understandably made them more aware than their users of the deficiencies.

C. Collection Development

This section was concerned with the selection and budgeting for books and journals and related materials, as well as the outlook for cooperative activities involved in collection development.

19. Librarians comment on their collections. Note lower ratings for monographs (books). See #20 for user reaction.

Would you rate your current collection development activities as?

	Books	Serials
Excellent	15%	30%
Better than average	57	50
Average	22	20
Unsatisfactory	6	-

20. Users give their opinions of the collections. Lower ratings for books are apparent.

How would you rate the collections in these libraries?

	Books		Serials	
	Faculty	Students	Faculty	Students
Excellent	24%	23%	34%	31%
Better than average	50	54	52	57
Average	23	18	12	6
Unsatisfactory	3	5	2	6

21. Librarians evaluate effects of budgets. Books are seen more affected than serials.

What effect have recent budgetary levels had on collection development activities and purchases?

(a) Monographs

Significant reductions	35%
Minor reductions	42
No effect	18
Improved	5

(b) Serials

Significant reductions	17%
Minor reductions	51
No effect	15
Improved	7

22. Users list their complaints about collections. Note large number unable to name one.

What is your main complaint regarding the collections?

Faculty		Students	
None	42%	None	42%
Not enough books	19	Not enough journals	20
Not enough journals	18	Not enough books	18
Texts outdated	5	Need more copies of key books	9
Lost books not replaced	4	Weak in certain subjects	7
Weak in particular subjects	4	Longer runs of key journals	7

C. Collection Development (Cont'd)

23. Librarians comment on projects with other libraries.

How would you rate the prospect for new cooperative agreements between your school and other groups as aiding your collection development goals?

(a) Local and regional arrangements		(b) National arrangements	
Excellent benefits likely	15%	Excellent benefits likely	[illegible]
Some benefits likely	65	Some benefits likely	[illegible]
No benefits likely	20	No benefits likely	[illegible]
Negative changes likely	-	Negative changes likely	[illegible]

24. Librarians cite special projects they favor. They apparently have little to suggest.

What would be the most important cooperative program for your science and engineering libraries to enter into with outside groups? Why?

None to suggest	65%
Collection policy coordination	22
Special union lists of serials	13

25. Machine-readable data bases are evaluated by librarians in terms of what can be afforded. (The question was put to them in terms of what priority such data bases would have if they could be obtained only by using funds now allocated for books and journals for this purpose).

What role do you recommend for your libraries in regard to the use of data bases in machine-readable form, assuming funding stays about at present levels?

Should lease many of them and offer complete services	-
Should lease only one or two of the most important ones	[illegible]
Should patronize other organizations, such as regional service groups set up for this purpose	20
Should merely act as a source of information for users, telling them of outside agencies to use	63
Other	2

26. Users rate machine-readable data bases in terms of budget considerations. (The same conditions of funding mentioned in #25 were used here). Note the high proportion unwilling to sacrifice books and journals for tape services.

What are your comments regarding the library's role in connection with data bases available in machine-readable form?

	Faculty	Students
Not worth it	81%	73%
Might be worth it	7	20
No comment	12	7

C. Collection Development (Cont'd)

Analysis of Questions 19-26

It was apparent in speaking with both users and technical librarians that the purchases of books were being reduced at most libraries so that serials could be given first priority for funds, since journals are so important in such libraries. However, there were complaints about the effects of lowered spending on books from both librarians and users. There were a few libraries as yet largely untouched by tighter budgets, but they were around 5-7% of the total studied, being definitely in the minority.

Cooperative projects seemed of value to most librarians, although as a group they had surprisingly little to suggest for new projects. In some schools energetic cooperative efforts are underway already, although the results are still not spectacular.

The question about machine-readable data bases was put in terms of a price tag, since if money were no object it is unlikely that anyone would recommend against getting them. As asked, it is definite that traditional literature still rates higher for most users and librarians than machine-readable data bases. This should not be construed as meaning that they lacked interest in modern searching and SDI techniques. It is just that many of them saw the tapes as essentially a duplication of what is available in printed form at a much smaller cost, and, where costs are a factor, the overall opinions were that they would have to take a second priority to the literature, especially the key books and journals. If money were no object, it is certain that they would have liked to have computer tape services. It should be noted, however, that many users, including professors, were barely aware that such tape services existed, much less what they could offer a user. Several professors felt that computer searching was still not satisfactory.

Library Directors' Comments on Collection Development

Directors generally agreed that it cost more to provide a collection for a faculty member or graduate student in science/engineering than the social sciences or humanities, and that journals were the most important type of literature in technical university libraries. They predicted that the use of machine-readable data bases would spread to the social sciences and humanities in due time. One administrator said that computer-based services were forcing cooperation which might not otherwise have occurred because of the costs involved. Yet several of them remarked that at present they have not been aware of any great amount of pressure on the part of users for the providing of tape services.

One director lamented the poor showing of cooperative efforts so far, although he was strongly in favor of the goals they sought. Most cooperative efforts were government supported. The Pacific Northwest Bibliographic Center, located at and operated by the University of Washington Library, was one notable example of a government-supported (state) cooperative project, answering 500-1000 requests per month-which result in around 300 loans per month. Another example is in New York where the state pays participating libraries a flat fee for each request and each loan made to libraries within that state, thus reimbursing costs for libraries, such

C. Collection Development (Cont'd)

as Columbia, who were selected to take part in the program. Over 500 requests are received per month at that school on this project. In Canada the National Science Library had taken the steps to obtain several computer tapes, thus saving other Canadian libraries from having to lease their own if they were willing to handle queries and run profiles on a mail basis. The University of British Columbia Library was paying all or most of the service fee for its professors using these tape services, mostly to encourage greater use.

Approval plans operated by jobbers were used by many libraries, particularly the University of Toronto, which was committed to a heavy buying program for monographs.

Most schools let each librarian in science/engineering libraries act rather independently in making selections of books and journals, but others used a divisional librarian to make final selection decisions or else someone in the main library's acquisition department. In a few cases departments of intruction played a big role in making final selections, and in more than one case each department had a professor acting to review all requests within his department prior to submission to the library. Often faculty participation is not easy to obtain. One director spoke of the greater difficulty in making selections in technical fields compared to those in non-technical subjects and the need for subject competence for good selection decisions by the library staff.

Only one director mentioned the growing problem of obtaining audio-visual materials, which seemed to be growing fast in popularity at his school. Apparently it was not yet a problem common to all schools.

Author's Comments on Collection Development

One prominent feature of the present picture is the relatively slow progress being made on cooperative decisions within a region or a state (or a province) in obtaining working agreements among the libraries in the area on collection development. Often each library was going its own independent way, seemingly unwilling or unable to make decisions in a cooperative way. Rivalry was strong in some cases, with the resulting duplication in large part unnecessary. Tighter budgets have literally forced more attention to this problem, but the results to date are not impressive. No doubt legal and practical problems of relying upon other institutions are formidable, but one wonders if lack of effort to overcome such difficulties is not the real reason for lack of progress. One plan being studied involves several large university library systems located in different states who are considering a daily messenger traveling on public buses to carry interlibrary loans, thus conceivably allowing the libraries to find it easier to make reductions of purchases in certain agreed upon fields now largely duplicated. Implementation has yet to come. Many faculty members and graduate students gave the impression in interviews that if interlibrary loans could be obtained in a few days there was little likelihood of this being too slow, assuming that basic materials used constantly were still obtainable locally. So it is likely that there would not be strong pressures among users for libraries to hold onto little-used or even lesser-used materials if good interlibrary loan service were available.

One library (Columbia) has coded its collection policies for each library in machine-readable form so that annual updating will be facilitated. It is based on major topics in the LC classification.

Most libraries using approval services looked upon them as basically a means to get a large portion of the newer monographs into the library easily and at lower costs than individual orders would have permitted, but that perusal of advertisements, book selection tools, bibliographies, etc., were still necessary for a good collection development program. Several librarians complained about the tendencies of certain commercial publishers to issue an overabundance of new serials, most of them unnecessary. A bibliographic birth control program in this field would be welcomed, since established serials already cost so much in technical libraries.

D. Professional Staff Background and Attitudes

This section was concerned with the training, background, performance and attitudes of the professional staff in science/engineering libraries.

27. Librarians describe their collegiate training in the sciences or engineering and their prior job experience in those fields (not in librarianship). Note that almost three-fourths had had collegiate level science/engineering training, with nearly half having degrees in these fields. Most had library degrees (93%).

What background have you had in the sciences or engineering? (Assume Library degree unless checked) 7%

Previous job experience	17%
No collegiate training	24
Some, but no degree	30
Bachelor's degree	22
Master's degree	20
Doctorate degree	1

28. Librarians describe their fitness for their jobs.

Would you say your background and training were,

Adequate for your job as now set up.	74%
Inadequate for your job as now set up	11
More than adequate for your job as now set up	15

29. Librarians describe the utilization of their training and job experience in the sciences/engineering at their present jobs.

Do you feel that your job, as now set up,

Fully utilizes your background and training.	35%
Only partially utilizes your background and training	62
Makes little use of your background and training	3

D. Professional Staff (Cont'd

30. Users rate the professional staff. Note that over three-fourths of them gave better than average or higher ratings to the librarians.

What is your rating of the professional staff serving in the science and engineering libraries?

	Faculty	Student
Excellent	37%	38%
Better than average	48	38
Average	12	12
Unsatisfactory	2	2
No opinion	1	10

31. Users list specific complaints. Note that over three-fourths could not list a major complaint.

What is your main complaint regarding the professional staff?

Faculty		Student	
None	78%	None	87%
More science training desirable	6	More help needed	9
More professional help needed	6	Miscellaneous	4
Incompetent	4		
Too much turnover	4		
Miscellaneous	2		

32. Librarians describe their overall feelings about their jobs. Note the high level of satisfaction.

Everything considered, what is your feeling regarding your present position?

Very satisfied	50%
Reasonably satisfied	42
Other	8

33. Librarians describe what they like best about their work. ("Professional status" was defined as all that goes with being a librarian at their school, regardless of type of assignment involved, versus being a professor or in some other line of work there. "Duties of the position" concerned the actual details of their particular positions.) Note that being a librarian rated very high, with duties second.

What factors (number in decreasing order of priority) contribute the most to your job satisfaction?*

	#1	#2	#3	#4
Salary	3%	10%	37%	44%
Professional status (in a general sense	51	25	13	5
Duties of the position	33	58	7	-
Physical facilities	2	7	37	40
Other (Staff relationships; academic world)	11	-	3	3

*Not all named 4 choices (some only 2 or 3)

D. Professional Staff (Cont'd)

34. Librarians describe what they disliked the most about their work. (The same definitions in #33 applied here). Note that dislike of their salary was not as great as the dislike of physical facilities or duties, as far as a #1 choice was concerned, although it was very close.

What factors (number in decreasing order of priority) contribute the most to your job dissatisfaction?*

	#1	#2	#3	#4
Salary	18%	23%	20%	5%
Professional status (in a general sense)	10	23	13	20
Duties of the position	20	20	15	17
Physical facilities	27	17	10	12
Other (budgets, staff relationships, security)	12	-	-	-
None	13	-	-	-

*Not all named 4 choices (some only 2 or 3)

Analysis of Questions (27-34)

The fact that nearly half the librarians had degrees in science or engineering, in addition to their library degrees, may give some reassurance to those who feel that such librarians are difficult to find. Adding in those who at least had had some collegiate science/engineering courses raises the total to nearly 75%. It was interesting to note that those 11% who felt they were inadequately prepared for their jobs included 30% with a Bachelor's degree, while the rest had either no technical training or only some courses. On the other hand, of those who felt more than adequately prepared 80% had either a Master's or a Bachelor's degree, the other 20% having at least had some courses but no degree. But in general, most librarians felt they were adequately prepared, in many cases achieving a good deal of competency from on-the-job experience. It should be noted that 10% of the professors described the librarians as either incompetent or lacking enough technical background, so the matter of background did not go unnoticed by the faculty members. The small percentage without a library degree seemed largely to be long-time employees who learned most of their skills on the job, perhaps having a degree in the sciences/engineering to help qualify them for the work. Most librarians felt their background and training were so diversified that they did not consider it unusual that their work utilized their backgrounds only partially.

It might be reassuring to library directors to learn that 92% of the librarians interviewed were reasonably satisfied or better. It is interesting to note that while salaries were by far the last choice for job satisfaction, they were second to physical facilities or duties as a prime source of dissatisfaction. Apparently while librarians in these jobs are far from satisfied with their salaries there are other factors that cause them more dissatisfaction. It was also discovered that some librarians found that one factor- usually duties- was both the source of their greatest satisfaction as well as their greatest dissatisfaction.

D. Professional Staff (Cont'd)

Library Directors' Comments on Professional Staff Matters

Directors were almost evenly divided as to whether or not it was becoming easier to find good librarians with science/engineering training and backgrounds. In some regions where industry had cut back, such librarians were more available than formerly, whereas in other areas it was still not an easy recruiting task. However, most directors agreed that while such a technical background is highly desirable for science/engineering libraries at universities, it was no guarantee of success, nor was lack of such a background necessarily a guarantee of a librarian's failing or doing poorly at the job. All things being equal, directors felt that technical training was highly desirable but not an absolute necessity. Directors pointed out that another feature of the current scene is a lower turnover rate in these jobs, due no doubt to the diminished number of alternate jobs available.

In regard to the question of the professional demands made of librarians, several directors felt that centralized science/engineering libraries made for more professionally challenging positions than those in smaller libraries in decentralized systems.

Author's Comments on Professional Staff Matters

An informal correlation of users' ratings of librarians and the background and training of the librarians showed the author that such experience is not a guarantee of success, as the directors stated, although they (the users, the librarians and the directors) all seemed to agree that a good technical background was desirable. But some librarians without good technical backgrounds made up for it by learning on the job and by having an unusually high level of interest in making a success on the job. A few well-trained librarians seemed a bit on the complacent side, which did little to further their status with their users.

One of the subtle factors which affect a librarian's job satisfaction has to do with relationships with top administrators supervising the librarian. Several of the librarians indicated they felt a need to be more involved in administrative decisions appropriate to their jobs. Some of them felt that being left out of such decision was more of a hurdle to job satisfaction than salary levels, although few of them felt they were completely satisfied with their salaries. But job satisfaction to them seemed intimately concerned with the amount of challenge offered by their jobs. Often the small libraries did not present enough of a challenge to sustain the interest of an alert, ambitious librarian many years after learning the job, while many of the larger, centralized libraries seemed to contain more suitable positions for professionals in terms of a long time period. Often outside assignments involving library-wide problems or tasks added the extra interest needed to keep librarians satisfied in these positions, particularly those who had been at their assignments for many years. Full utilization of their talents is often the difference between librarians who are "reasonably satisfied" and those who are "very satisfied".

In terms of organization and supervision, several of the schools had one person serving as head of the science/engineering library division or grouping, while others had several librarians responsible for such libraries. Where there were many libraries and where there was no one person with this responsibility, it appeared that coordination and cohesiveness suffered somewhat.

It was noted that the larger library systems all had professional staff associations in existence, serving as a forum and focus of professional opinions. Most had elected executive committees. Peer evaluation, job classifications, and promotional policies were prime topics of activity and study.

IV. General Comments and Conclusions of the Author

One fact which stood out during this project is the rather low degree of communication between librarians and their users. Time after time an interview would show that the faculty member or student had some deeply felt comments to make about library service but no one had ever made it easy for him to express himself. Human nature being what it is, few people take the trouble to seek out those who operate service groups until or unless they are deeply troubled over the service, at which point it is often too late for a quiet, thoughtful discussion of library service. Librarians should regularly and systematically talk to their users- not just the "friends of the library" type, who can be counted upon to drop in frequently, but those who are not known to the staff, or perhaps do not use the library much at all. Their needs and their dissatisfactions should be studied, and efforts made thereafter to remedy the situations they complain about. As an example along this line, there is a notebook for complaints and comments which is kept at the desk of the Engineering Library at MIT. The user writes his comment or complaint (and his name) in the book, then in due time the answer is recorded along side his remarks. One advantage of this simple system is that it shows other users that complaints do get answered, and perhaps someone browsing through it may either learn something new or even find his own question answered by a previous complaint.

In general, science and engineering libraries in universities are doing a creditable job of keeping their users satisfied in spite of tighter funds for collections and other budgetary restraints, including job freezes. Automation is gradually finding its way into these libraries in useful projects, with computer-printed union lists of serials for a given university (and even including other schools in a closely-knit region) as probably the most useful type of project so far in use. Most librarians do not have as much reference work as they would like, and word of mouth advertising by satisfied users was said by them to be one of the best means for building up the level of reference work. There is still a slight feeling of distrust on the part of some professors regarding the use of computer searching, while others are still quite ignorant of what is available, much less be interested in it for themselves. So a large selling job is needed before most faculty members are going to be avid customers for tape services, and most libraries do not have the funds to furnish the service if it were requested. Use of the professors's grants and project money is one solution, but first he has to find out that it

is worth it. It is obvious that most of the tape service projects at schools are federally-funded; little is known about what their status will be when the funds are all spent.

Librarians seem generally to enjoy a position in the eyes of users as being competent and helpful, with but few exceptions. Yet many of the users are not what could be called heavy users of their libraries and often seemed to be satisfied by rather simple services on the part of the library. Again, there is much to be done to increase the amount of reference use of the libraries.

There is no doubt that libraries have had to reduce the purchase of monographs in order to keep the serials going, although the latter are being subjected to scrutiny and the reduction of locally-duplicated titles or little-used expensive items. There is a need for much more progress in cooperative collection development in local and regional circles, so that the expensive duplication so common up to now is brought under control. Libraries should not, and cannot, continue on their old independent ways. Several users criticized this tendency as being too wasteful in view of the financial conditions of the present time as well as the much-discussed growing flood of information available.

The facilities of the libraries visited cover a great range - from excellent to incredibly bad. Those schools with fewer library buildings seem to have the best ones, especially those with only one science library, most of which were new and very pleasant to be in. Yet one school which has only one library had one of the worst ones seen, so generalities are difficult to make. But longer hours of service and better reference service are apparently easier to provide where centralization is being tried. Yet many users are afraid to lose their local libraries, and when centralization takes place the creation of departmental reading rooms seems a necessary related step to take. On the whole it appears to be a reasonable price to pay for centralization. The needs of scientists and engineers for quick access to a few key journals runs and to important reference books is understandable, especially on the larger campuses. Delivery service to faculty members is another requirement for successful centralization of facilities, as well as simple, quick photocopying service. Hours of service in the summer and at intersessions have understandably been cut to save money, but graduate students and faculty members complained that these were the very times when they had hoped to get extra work in at the library. It is no accident that the longest hours were offered in libraries which were heavily centralized, with the 365 days per year service from 8 AM to midnight at Johns Hopkins probably the best setup seen during the project, coupled as it was with a midnight to 8 AM reading room nearby, open five nights a week.

Science and engineering libraries are working well, often under difficult conditions, but some local soul-searching and a reexamination of priorities and standards would be well advised for all of them.

* * * * * *

Appreciation is expressed to the Council on Library Resources for the fellowship which funded this survey and to Columbia University Libraries for granting the leave which made it possible to carry out the project.

Appendix A

Description of University Library Systems Visited

As previously stated, the selection of university library systems to visit was made on the basis of attempting to get a well-balanced mixture of types of library systems in regard to size, type of funding, geographical location, setting (urban or non-urban), organization of facilities (centralized vs. decentralized), interest in automation, etc. Naturally many interesting systems could not be included because of the limitations of time. However, it is felt that the ones selected do present a reasonable cross-section of university library systems, particularly in the United States. The two from Canada, being large, are thus typical of only a portion of that country's university library systems, but they do add a very useful and welcome source of data for the study.

Together these 22 library systems represent schools serving a total of around 340,000 students, having a combined collection of over 52 million books and bound periodicals and having a total of 1,960 professional librarians. They range from schools having a few thousand students to those in the 30,000 bracket, and library sizes range from under half a million volumes to over 8 million, while professional staff sizes go from under 20 to over 200.

Collection sizes are restricted to books and bound periodical volumes, and enrollment is usually in terms of full-time students. The figures for those professionals serving science/engineering are restricted to reader service positions, not including technical services or other functions. Figures are for 1972 unless otherwise indicated.

United States

California Institute of Technology. Pasadena, California.
Enrollment-1500. Library size-254,000 volumes. Professional staff-7, of which 4 serve science/engineering. Has 6 library units under professional supervision, of which 4 serve science/engineering In addition there are 3 reading rooms under the control of departments of instruction. Partially decentralized system. Small campus in a suburban setting. Privately supported.

Columbia University. New York, New York.
Enrollment-14,500. Library size-4,354,000 volumes. Professional staff-139, of which 7 serve science/engineering. Has 35 library units under professional supervision, of which 8 serve science/ engineering. Decentralized system. Small campus in an urban setting. Privately supported.

Appendix A (Cont'd)

Florida Atlantic University. Boca Raton, Florida.
Enrollment-5,000. Library size-475,000 volumes. Professional staff-14 of which 1 serves science/engineering. Has one library, with one floor devoted to science/engineering. Centralized system. Moderate-sized campus in a suburban setting. State supported.

Georgia Institute of Technology. Atlanta, Georgia.
Enrollment-8,000 (1971). Library size-761,000 volumes. Professional staff-35, of which 9 serve science/engineering. Has main library and one branch under professional supervision, and main unit serves science/engineering. In addition there are 3 reading rooms under the control of departments of instruction. Centralized system. Large campus in an urban setting. State supported.

Harvard University. Cambridge, Massachusetts.
Enrollment-15,000. Library size-8,607,000 volumes. (1971). Professional staff-228, of which 9 serve science/engineering. Has 46 library units under professional supervision, of which 9 serve science/engineering. In addition there are about 50 other libraries and reading rooms under the control of departments of instruction. Decentralized system. Moderately large campus in an urban setting. Privately supported.

Johns Hopkins University. Baltimore, Maryland.
Enrollment- 3,500. Library size-1,900,000 volumes. Professional staff-32, of which 2 serve science/engineering. Has one library unit, with one floor devoted to science/engineering. In addition there are 6 reading rooms, all but one of which are under the control of departments of instruction. Centralized system. Moderate-sized campus in an urban setting. Privately supported.

Lehigh University. Bethlehem, Pennsylvania.
Enrollment-4,000. Library size-565,000 volumes. Professional staff-14, of which 3 serve science/engineering. Has two library units under professional supervision, of which 1 serves science/engineering. In addition there are several reading rooms under the control of departments of instruction. Centralized system. Moderate-sized campus in a suburban setting. Privately supported.

Massachusetts Institute of Technology. Cambridge, Massachusetts.
Enrollment-6,000. Library size-1,383,000 volumes. Professional staff-58 of which 14 serve science/engineering. Has 11 library units under professional supervision, of which 6 serve science/engineering. In addition there are about 30 reading rooms under the control of departments of instruction. Relatively decentralized system. Moderate-sized campus in an urban setting. Privately supported.

Appendix A (Cont'd)

Oregon State University. Corvallis, Oregon.
Enrollment-16,000. Library size-670,000 volumes. Professional staff-30, of which 3 serve science/engineering. Has one library, with one floor devoted to science/engineering. In addition there are 9 reading rooms under the control of departments of instruction. Centralized system. Large campus in a suburban setting. State supported.

Polytechnic Institute of Brooklyn. Brooklyn, New York.
Enrollment-3,200. Library size-200,000 volumes. Professional staff-10, of which 3 serve science/engineering. Has one library (on main campus), mostly devoted to science/engineering. In addition there are a few reading rooms under the control of departments of instruction. Centralized system. Small campus in an urban setting. Partially state supported.

Stanford University. Stanford, California.
Enrollment-12,500. Library size-3,825,000 volumes. Professional staff-140, of which 10 serve science/engineering. Has 50 library units under professional supervision of which 17 serve science/engineering In addition there are several reading rooms under the control of departments of instruction. Decentralized system. Moderate-sized campus in a suburban setting. Privately supported.

University of Arizona. Tucson, Arizona.
Enrollment-27,000. Library size-764,000 volumes. Professional staff-56, of which 5 serve science/engineering. Has 8 library units under professional supervision, of which 1 serves science/engineering. In addition there are several reading rooms under the control of departments of instruction. Centralized system. Moderately large campus in an urban setting. State supported.

University of California, Berkeley. Berkeley, California.
Enrollment-28,000. Library size-4,000,000 volumes. Professional staff-140, of which 16 serve science/engineering. Has 33 library units under professional supervision, of which 11 serve science/engineering. In addition there are several reading rooms under the control of departments of instruction. Decentralized system. Large campus in an urban setting. State supported.

University of California, Los Angeles. Los Angeles, California.
Enrollment 25,000. Library size-3,164,000 volumes. Professional staff-159, of which 8 serve physical science/engineering. Has 15 library units under professional supervision, of which 8 serve physical science/engineering. In addition there are several reading rooms under the control of departments of instruction. Decentralized system. Large campus in an urban setting. State supported.

Appendix A (Cont'd)

University of Georgia. Athens, Georgia.
Enrollment-18,000. Library size-1,245,000 volumes. Professional staff-71, of which 6 serve science/engineering. Has 3 library units under professional supervision, of which 1 serves science/engineering. In addition there are 10 reading rooms under the control of departments of instruction. Centralized system. Large campus in a semi-rural setting. State supported.

University of Miami. Coral Gables, Florida.
Enrollment-12,000 (1971). Library size-1,037,000 volumes. Professional staff-45, of which 2 serve science/engineering. Has 6 library units under professional supervision, of which 3 serve science/engineering. In addition there is one reading room under the control of a department of instruction. Relatively centralized system. Moderate-sized campus in a suburban setting. Privately supported.

University of Michigan. Ann Arbor, Michigan.
Enrollment-36,000. Library size-4,556,000 volumes. Professional staff-123, of which 12 serve science/engineering. Has 30 library units under professional supervision, of which 13 serve science/engineering. In addition there are several reading rooms under the control of departments of instruction. Decentralized system. Large campus in an urban setting. State supported.

University of Pittsburgh. Pittsburgh, Pennsylvania
Enrollment-21,000 (1971). Library size-1,580,000 volumes. Professional staff-113, of which 3 serve science/engineering. Has 18 library units under professional supervision, of which 4 serve science/engineering. In addition there are 10 reading rooms under the control of departments of instruction. Decentralized system. Large campus in an urban setting. Partially state supported.

University of Washington. Seattle, Washington.
Enrollment-33,000. Library size-1,877,000 (1971) volumes. Professional staff-113, of which 9 serve science/engineering. Has 21 library units under professional supervision, of which 7 serve science/engineering. In addition there are several reading rooms under the control of departments of instruction. Decentralized system. Very large campus in an urban setting. State supported.

Yale University. New Haven, Connecticut.
Enrollment-9,000. Library size-5,994,000 volumes. Professional staff-181, of which 5 serve science/engineering. Has 32 library units under professional supervision, of which 7 serve science/engineering. In addition there are about 30 reading rooms under the control of departments of instruction. Relatively decentralized system. Moderately large campus in an urban setting. Privately supported.

Appendix A (Cont'd)

Canada

University of British Columbia. Vancouver, British Columbia.
Enrollment-19,000. Library size-1,535,000 volumes. Professional staff-101, of which 12 serve science/engineering. Has 13 library units under professional supervision, of which 4 serve science/engineering. In addition there are 38 reading rooms under the control of departments of instruction. Decentralized system. Large campus in a suburban setting. Government supported.

University of Toronto. Toronto, Ontario.
Enrollment- 25,000. Library size-3,648,000 volumes. Professional staff-151, of which 18 serve science/engineering. Has 14 library units under professional supervision, of which 6 serve science/engineering. In addition there are 38 libraries and several reading rooms under the control of departments of instruction. Decentralized system. Large campus in an urban setting. Government supported.

Survey of Opinions of Professional Librarians

Serving in University Science and Engineering

Libraries

Interview No. P____

Note: Unless otherwise stated, the term "Libraries" is meant to refer only to library units primarily serving in the subject areas of engineering or science. Questions involving evaluations are to be answered in terms of the goals of the library being studied.

I. Services offered in Science and Engineering Libraries

1. Would you characterize the services normally offered by your library, on the whole, as

_____Excellent?
_____Better than average?
_____Average?
_____Unsatisfactory?

2. Which service offered seems to you to need the most improvement?

3. What is the most common complaint of your users regarding your services?

4. Do you offer any unusual services to your users? If so, what? If not, what services would you like to add?

5. What effect has automation had on the services rendered by your library?

_____Little or none
_____Rather helpful
_____Very helpful
_____Not involved at present

6. What uses of automation would you like to see instituted in your library (in regard to services to the public)?

II. Physical facilities of Science and Engineering Libraries

1. Would you rate the physical facilities and locations of your libraries, on the average, as

_____Excellent?
_____Better than average?
_____Average?
_____Unsatisfactory?

2. What is the major problem in this regard?

3. In regard to centralization versus decentralization, would you say the science and engineering library facilities should

_____become more centralized?
_____stay about as is?
_____become less centralized?

4. Do you think your feelings on question #3 match those of

(a) Faculty members? (b) Graduate students? (C) Undergraduates?

(a)	(b)	(C)
_____Yes	_____Yes	_____Yes
_____No	_____No	_____No
_____Don't know	_____Don't know	_____Don't know

5. What effect do you think the changes caused by automation have had in the number, location and design of your library facilities to date?

_____Little or none
_____Some effects
_____Major effects

6. In what ways do you expect this to change in the next 5-10 years?

III. Collection Development for Science and Engineering Libraries

1. Would you rate your current collection development activities as

_____Excellent
_____Better than average?
_____Average?
_____Unsatisfactory?

2. What effect have recent budgetary levels had on collection development activities and purchases?

(a) Monographs

_____Significant reductions
_____Minor reductions
_____No effect
_____Improved

(b) Serials

_____Significant reductions
_____Minor reductions
_____No effect
_____Improved

3. How would you rate the prospect for new cooperative agreements between your school and other groups as aiding your collection development goals?

(a) Local and regional arrangements

_____Excellent benefits likely
_____Some benefits likely
_____No benefits likely
_____Negative changes likely

(b) National arrangements

_____Excellent benefits likely
_____Some benefits likely
_____No benefits likely
_____Negative changes likely

4. What would be the most important cooperative program for your science and engineering libraries to enter into with outside groups? Why?

5. What role do you recommend for your libraries in regard to the use of data bases in machine readable form, assuming funding stays about at present levels?

_____Should lease many of them and offer complete services.
_____Should lease only one or two of the most important ones
_____Should patronize other organizations, such as regional service groups set up for this purpose
_____Should merely act as a source of information for users, telling them of outside agencies to use
_____Other (specify)

IV. Staffing of Science and Engineering Libraries (Professional staff)

1. What background have you had in the sciences or engineering? (Assume Library degree unless checked____).

_____Previous job experience
_____No collegiate training
_____Some, but no degree
_____Bachelor's degree
_____Master's degree
_____Doctorate degree

2. Would you say your background and training were,

_____Adequate for your job as now set up?
_____Inadequate for your job as now set up?
_____More than adequate for your job as now set up?

3. Do you feel that your job, as now set up,

_____Fully utilizes your background and training?
_____Only partially utilizes your background and training?
_____Makes little use of your background and training?

4. Everything considered, what is your feeling regarding your present position?

_____Very satisfied?
_____Reasonably satisfied?
_____Other (specify)

5. What factors (number in decreasing order of priority) contribute the most to your job satisfaction?

_____Salary
_____Professional status (in a general sense)
_____Duties of the position
_____Physical facilities
_____Other (specify)

6. What factors (number in decreasing order of priority) contribute the most to your job dissatisfaction?

_____Salary
_____Professional status (in a general sense)
_____Duties of the position
_____Physical facilities
_____Other (specify)

Appendix C

1972

Survey of Opinions of Faculty Members,
Research Personnel or Students
Using Science and Engineering Libraries

Interview No. U_____

Status

_____Faculty Member _____Research Personnel _____Graduate Student _____Undergraduate Student

I. Services Offered in Science and Engineering Libraries

1. What is your opinion of the quality of service offered by the libraries devoted to science and engineering on your campus, for an institution of the size and status of your school?

_____Excellent
_____Better than average
_____Average
_____Unsatisfactory

2. What is your biggest complaint about services offered?

3. What, if any, new services would you like to see instituted?

II. Physical facilities of Science and Engineering Libraries

1. What is your opinion of the physical facilities of science and engineering libraries on your campus, again considering what is appropriate for local standards?

_____Excellent
_____Better than average
_____Average
_____Unsatisfactory

2. How do you view the facilities regarding the question of consolidation of subject libraries versus more decentralized libraries?

_____Should be more centralized
_____Should stay about as is
_____Should be less centralized

3. What is your main complaint regarding the facilities?

III. Collection Development in Science and Engineering Libraries

1. How would you rate the collections in these libraries?

_____Excellent
_____Better than average
_____Average
_____Unsatisfactory

2. What are your comments regarding the library's role in connection with data bases available in machine readable form?

3. What is your main complaint regarding the collections?

IV. Staffing of Science and Engineering Libraries

1. What is your rating of the professional staff serving in the science and engineering libraries?

_____Excellent
_____Better than average
_____Average
_____Unsatisfactory

2. What is your main complaint regarding the professional staff?